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Coercivity and Nano-structure in Magnetic Spinel $Mg(Mn,Fe)_2O_4$ CHENGLIN ZHANG, S. YEO, S.-W. CHEONG, Department of Physics & Astronomy, Rutgers University, Piscataway, New Jersey 08854, Y. HORIBE, S. MORI COLLABORATION[1], C. M. TSENG, C. H. CHEN COLLABORATION[2] — We discovered that the micro-to-nano-structure of $Mg(Mn,Fe)_2O_4$ drastically changes with different thermal treatment. This extraordinary structural evolution is associated with spinodal chemical decomposition associate with the Jahn-Teller structural distortions around Mn ions. The magnetic properties of the polycrystalline $Mg(Mn,Fe)_2O_4$ vary with the structural progress. Particularly, the Curie temperature and magnetic coervcivity considerably change with the structural evolution. The significantly-enhanced coercivity in the system with elongated nanostuructre stems from the large shape anisotropy of the nanostructure.

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